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SCIENCE NEWS LETTER



THE WEEKLY SUMMARY OF CURRENT SCIENCE•



"Looking Unpleasant" for the Camera

See Page 200



MARCH 28, 1931

A

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The Weekly
Summary of
**Current
Science**



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Edited by WATSON DAVIS

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DO YOU KNOW THAT

The latest architecture for beehives is a skyscraper design, four stories high.

Injuries from splinters cost one State a third of a million dollars in compensation last year.

Prematurely gray hair may be due to a lack of some unknown food material, similar to the vitamins, is the speculation of several French scientists.

Complete disappearance of diphtheria and typhoid in New York State in 20 years is predicted by Dr. Livingston Farrand, president of Cornell University.

A British laborer, digging a pipe-trench in a meadow, recently found a black pot of Roman-British days, containing about 1,000 coins of the third century A. D.

Because women who live alone are apt to eat irregularly, the U. S. Bureau of Home Economics has worked out a guide of the food requirements for a single adult.

A bee's average load of nectar is about half the weight of its body.

The oldest musical instrument appears to have been a flute.

Hero, of Alexandria, experimented with the idea of a steam engine about 150 B. C.

Psittacosis, or parrot fever, was reported in the United States as far back as 1904.

A new invention makes it possible for window cleaners to wash the outside of windows, while remaining safely inside.

The trade value of a wolf skin used to be two cups of sugar, and a beaver skin half a cup of sugar, says a man who was in Montana back in 1872.

Dragon flies of the coal forming age of geological history were found recently in Mongolia by an expedition led by Dr. Sven Hedin.

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Science Service presents over the radio, an address

HOW INSECTS AFFECT OUR HEALTH AND COMFORT

By F. C. Bishopp, Principal Entomologist in Charge of Insects Affecting Man and Animals, Bureau of Entomology, U. S. Department of Agriculture

Friday, April 3, 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

PHYSICS

Einstein Finds Past Events Not Knowable With Certainty

Pioneer in Quantum Research Joins With Drs. Tolman And Podolsky in Extension of Indeterminacy Principle

PROF. ALBERT EINSTEIN has concluded that past events of any sort can not be described with precise certainty.

This amazing extension of the principles of the new physics is contained in a letter to the editor of the *Physical Review*, journal of the American Physical Society. Prof. Einstein, jointly with Prof. Richard C. Tolman and Dr. Boris Podolsky of the California Institute of Technology, wrote this communication just before he left Pasadena to return to Germany.

Not only does Prof. Einstein conclude that there is an uncertainty in the description of what has happened in the submicroscopic world with which the most recent theories of physics usually deal. He applies this disconcerting principle of uncertainty to such everyday happenings as the opening and closing of a shutter on a camera. We can not know exactly just when a shutter opens or closes.

"It is of special interest to emphasize the remarkable conclusion that the principles of quantum mechanics would actually impose limitations on the localization in time of a macroscopic phenomenon such as the opening and closing of a shutter," Prof. Einstein and his two colleagues write.

Theory That Future is Unknown

The idea that it is impossible to predict the exact path of an object in the future was advanced four years ago by a young German physicist, Prof. W. Heisenberg. This principle of uncertainty has had an influence on the philosophy as well as the practice of science comparable with the idea of relativity introduced by Einstein.

As the opening paragraph of the Einstein-Tolman-Podolsky letter states:

"It is well known that the principles of quantum mechanics limit the possibilities of exact prediction as to the future path of a particle. It has sometimes been supposed, nevertheless, that the quantum mechanics would permit an exact description in the past path of a particle."

Prof. Einstein laid one of the foundations of the quantum theory, building on the work of Prof. Max Planck. The Einstein classic paper of 1905 applied the quantum theory of energy to light and electricity. The quantum idea that energy is not continuous but in packets or gobs like matter has been one of the most fruitful conceptions of the new physics.

Now Prof. Einstein adds the latest building block to our conception of matter and energy by telling us that the past as well as the future is uncertain.

Einstein's Associates

Prof. Einstein's associates in his new pronouncement are on the staff of the California Institute of Technology at Pasadena, where he worked during his recent stay in America. Prof. Tolman is one of the leading authorities on thermodynamics. His theory of a non-static universe replaced the Einstein theory of the universe. Dr. Podolsky is a young physicist, Russian born but now an American citizen. He was a National Research fellow in physics for several years.

The letter, under the title "Knowledge of Past and Future in Quantum Mechanics," reads in part:

"The purpose of the present note is to discuss a simple ideal experiment which shows that the possibility of describing the past path of one particle would lead to predictions as to the future behaviour of a second particle of a kind not allowed in the quantum mechanics. It will hence be concluded that the principles of quantum mechanics actually involve an uncertainty in the description of past events which is analogous to the uncertainty in the prediction of future events. And it will be shown for the case in hand, that this uncertainty in the description of the past arises from a limitation of the knowledge that can be obtained by measurement of momentum."

"Consider a small box B, as shown in the figure, containing a number of identical particles in thermal agitation,

and provided with two small openings which are closed by the shutter S. The shutter is arranged to open automatically for a short time and then close again, and the number of particles in the box is so chosen that cases arise in which one particle leaves the box and travels over the direct path SO to an observer at O, and a second particle travels over the longer path SRO through elastic reflection at the ellipsoidal reflector R.

Box Accurately Weighed

"The box is accurately weighed before and after the shutter has opened in order to determine the total energy of the particles which have left, and the observer at O is provided with means for observing the arrival of particles, a clock for measuring their time of arrival, and some apparatus for measuring momentum. Furthermore the distance SO and SRO are accurately measured beforehand—the distance SO being sufficient so that the rate of the clock at O is not disturbed by the gravitational effects involved in weighing the box, and the distance SRO being very long in order to permit an accurate reweighing of the box before the arrival of the second particle.

"Let us now suppose that the observer at O measures the momentum of the first particle as it approaches along the path SO, and then measures its time of arrival. Of course the latter observation, made for example with the help



EINSTEIN'S DIAGRAM

*This figure, which illustrates the letter to the *Physical Review*, shows paths of two particles escaping from box.*

of gamma-ray illumination, will change the momentum in an unknown manner. Nevertheless, knowing the momentum of the particle in the past, and hence also its past velocity and energy, it would seem possible to calculate the time when the shutter must have been open from the known time of arrival of the first particle, and to calculate the energy and velocity of the second particle from the known loss in the energy content of the box when the shutter opened. It would then seem possible to predict beforehand both the energy and the time of arrival of the second particle, a paradoxical result since energy and time are quantities which do not commute in quantum mechanics.

"The explanation of the apparent paradox must lie in the circumstance that the past motion of the first particle cannot be accurately determined as was assumed. Indeed, we are forced to con-

clude that there can be no method for measuring the momentum of a particle without changing its value. For example, an analysis of the method of observing the Doppler effect in the reflected infra-red light from an approaching particle shows that, although it permits a determination of the momentum of the particle both before and after collision with the light quantum used, it leaves an uncertainty as to the time at which the collision with the light quantum takes place. Thus in our example, although the velocity of the first particle could be determined both before and after interaction with the infra-red light, it would not be possible to determine the exact position along the path so at which the change in velocity occurred as would be necessary to obtain the exact time at which the shutter was open."

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EVOLUTION

Says Tennessee Will Repeal Anti-Evolution Law

Emotional Misunderstandings Aroused by Scopes Trial Declared to Have Passed; Legislature Originated Bill

By JUDGE JOHN R. NEAL

Chief Defense Counsel, Scopes Trial

THE bill to repeal the Tennessee anti-evolution law is a wholly spontaneous movement, originating in the legislature itself. It therefore gives great promise of success.

Courage on the part of the State University and high school authorities in supporting this repeal would secure its passage.

While the Scopes case put an end to the movement for passage of bills similar to the Tennessee anti-evolution law in other states, its effect in Tennessee was not such as had been hoped for by the group of Tennesseans responsible for originating the famous case. The Supreme Court of Tennessee, while indulging in some dicta upholding the law, based these dicta only on technicalities not relating to the constitutionality of the act, and thus not only prevented an authoritative State decision, but prevented an appeal to the Supreme Court of the United States.

Emotional misunderstandings aroused

in Tennessee by the Scopes case have largely passed away, and the people of the state now see the anti-evolution legislation in its true light. They perceive that the sole question it presents is as to whether we are to have freedom of thought and freedom of teaching in Tennessee.

With their minds unconfused as to the real issue, the Tennessee Legislature will undoubtedly bring Tennessee back into the ranks of civilized communities that desire for their youth the privilege of making their decisions for themselves.

Science News Letter, March 28, 1931

EVOLUTION

Principals in Dayton Case Remote From Repeal

WITH Judge John R. Neal, outstanding figure in Tennessee law and liberal politics, expressing his confidence that the Tennessee state legislature will repeal the law that five and a half years ago made the state a storm center of controversy and ridicule, the rest of the principal figures in the dra-

matic Dayton trial are remote from the new scene of action. They are not indifferent to the outcome of the effort to obtain a repeal of the anti-evolution law, but they apparently feel that the legislators will do away with the law without the intervention of persons from outside the state.

Possible Opponent Dead

The one man who might return to defend the bill against repeal, William Jennings Bryan, is dead. He was the first to pass of all those involved in the Dayton trial, and he died before the dust of battle was fairly settled, in the town where he had joined issues for a literal interpretation of the Bible against the upholders of science, whom he took to be its enemies.

Bryan's most dramatic opponent, Clarence Darrow, has retired from the practice of law and tries no more cases. He is heard from principally when he splinters a lance in debate over a philosophical or theological question. His associates, Arthur Garfield Hays and Dudley Field Malone, are still in practice in New York, and still make an exciting avocation of championing the cause of the economic and social under-dog. George Rappleyea, the engineer of Dayton whose suggestion over a glass of soda in a drug store started the whole affair, is now in business in New Orleans.

Scopes Now Geologist

John Scopes, the blond-haired, quiet young teacher who consented to be indicted and tried to make a test case of the statute, and to his amazement found himself the center of worldwide disturbance, continues his quiet way along the path of science. The trial crystallized a half-formed resolve he had to become a geologist. The autumn after it was over he entered the graduate school of the University of Chicago, and carried on his studies there for two years. Then he accepted a position as field geologist for an oil company, and spent three years in Venezuela. Not long ago he came back to America, bringing a wife with him—an American girl whom he had met in the tropics—and now he is back at the University of Chicago, finishing his work toward the Ph.D. degree.

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Peruvian Indians used cinchona bark as a remedy for malaria, but the advance step of separating the active constituent quinine from the bark was taken in 1820 by two French chemists.

PHYSIOLOGY

A Scientific Method of Weight Reduction

Prevention Is Better Than Any Cure But Diet Restriction Is a Slow But Sure Means: Working It Off Is Hopeless

By DR. F. G. BENEDICT

Director, Nutrition Laboratory, Carnegie Institution of Washington.

THE WEIGHT reduction wave that threatened to reduce all our young women to "bean-pole" outlines a year or so ago has happily in part receded, yet even today the interest in weight reduction is so great that the lecturer on physiology, medicine or nutrition has but to introduce the words, "weight reduction" at any part of his discourse to change a quiet, sleepy group into an eager, agitated, expectant band of zealots, all on edge to secure any last minute advice on the methods of losing flesh. To paraphrase a well-known text we may say, "Some people are born fat, some achieve fatness, and some have fatness thrust upon them." At the outset it is well for the body to be well nourished but not too fat. Babies are usually well nourished. One seldom hears of any efforts to make babies thin, although after they begin to be fed artificially there may be over-feeding with an over-fat baby. In the period of youth and adolescence there is usually, especially with boys, such a tremendous amount of surplus energy and muscular activity, that there is ordinarily no problem of weight reduction. With girls, too, in the grammar and high school age little difficulty arises. One season I had occasion to wait at the front door of a large high school for girls, containing 700 pupils. Not five of those pouring out of the doors could have been charged up as being decidedly too fat.

How Fatness is Achieved

But now, as to those that achieve fatness. The girl who gives up husky or tomboy activities for mid-Victorian repose and gentility begins to have trouble. She loves sweets; she loves delicacies and goodies just as before, but the exuberant activity of the early teens has by convention been repressed. The love for sweets has not been repressed and in goes the food and there is not the former outlet for the energy.

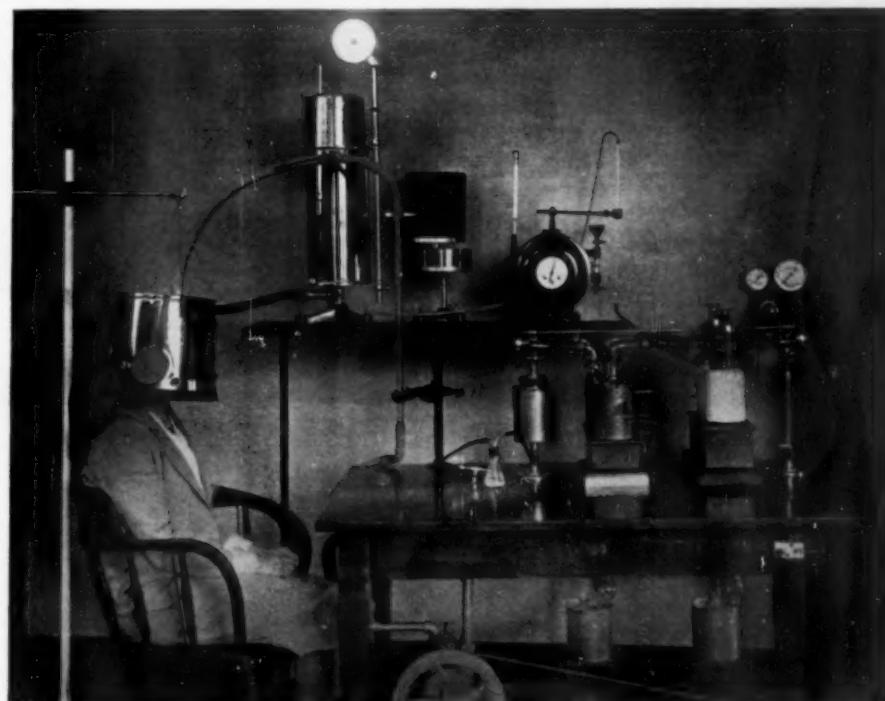
This article is one of the regular radio talks presented weekly over the Columbia Broadcasting System under the auspices of Science Service.

Our patient now begins to acquire fatness and the fight begins. Frankly until thirty-five years of age the question of over-weight is a matter chiefly of fashion, for a little extra plumpness is from the standpoint of health a real asset in the first three decades of life, since apparently it aids materially in helping to ward off the dread disease, tuberculosis. Statistics perform some curious feats, for apparently the night that you are thirty-five years of age the chances for a longer life are bettered if you are somewhat *under* rather than *overweight*, and it is between thirty-five and sixty years that the greatest danger appears and the struggle against the excess poundage is a real one. Why do people grow fat? There are to be sure a relatively small proportion of people with disordered glands who perhaps may be excepted, but in the vast proportion of cases there is just one answer; you eat each day a *little* more than you require. I repeat that you eat a *little* more than you require. If you eat the equivalent

each day of an ounce of butter more than you need what happens? You don't lose it; you don't burn it; it is digested, assimilated, and note this, it is deposited as fat. One extra ounce of fat means a pound in about two weeks or 25 pounds a year. All of this from but one ounce, say three pats of butter *extra* each day. Please note that I emphasize *extra*; that means three parts of butter *above* your daily needs. This goes on gradually, I might almost say insidiously, until the weight increases, the girth increases, the creases increase, and there you are.

Not Sudden

All this is not sudden. You may not note it or you may wilfully disregard it. You may say, "Oh well, in the spring I'll get out and work it off." How will the bathroom scales help us in this matter? If you have bathroom scales use them at least once a week. If necessary write down your weight and watch the changes. Pay no attention to *sudden* changes either *up* or *down*. Let us see! What about sudden changes? Perhaps the most remarkable instance of a sudden change in weight that I ever knew of was that of a football player who on



APPARATUS FOR MEASURING METABOLISM

Which tells the scientist the rate at which the food you eat is burned up to provide energy and new tissues for your body's needs. Food not used for energy or tissue repair accumulates as fat.

a warm fall afternoon lost 14 pounds during the afternoon and in this time he had played strenuous football for one hour. Now, thanks to careful analysis and studies in the physiological laboratory it is perfectly possible to analyze this loss. Is it all body tissue? Is it fat? Is it water? What part of it is water and what part of it is fat, etc?

Thirteen Pounds Water

We know that when a football player plays to the limit of human endurance he cannot produce more than say 600 or 700 calories of heat in one hour; in an extreme case 900 calories. Of course during this time he is eating nothing and his heat must come from material that is burned in the body and we will assume that it comes from fat. If this is all derived from fat it would require about 100 grams of fat to furnish these 900 calories. 100 grams of fat would be about $3\frac{1}{2}$ ounces. As a matter of fact, he probably would not burn exclusively fat; he would burn a little carbohydrate and some protein, but we can make an extreme case and say that he might have burned all told 100 grams of fat and 50 grams of either protein or carbohydrate. This is an extreme illustration. This makes a total of 150 grams of dry body tissue burned, that is about $\frac{1}{3}$ of a pound. Now dry body tissue is not peeled off the body either internally or externally as such; it is accompanied by water, and in this particular case we can see that if he burned only $\frac{1}{3}$ of a pound of dry body material and lost 14 pounds there must have been $13\frac{2}{3}$ pounds of that loss due simply and solely to water. This was really a drying out of the body and it was probably all regained in the water and other liquids consumed, so that in one or two days at the outside the weight was essentially back to the original level. This furthermore illustrates the futility of trying to "work off" fat that has been deposited in the body. If it takes the terrific strain of one hour's football competition to work off or burn up $\frac{1}{3}$ of a pound of body tissue what chance has the untrained, soft non-athlete to work off *any* material amount? Work means heat. The heat is derived from food or from body substance, so that by working one does work off body substance, but as we have seen in very small amounts.

To come back to our ounce of fat, let us make it rather than an ounce, a pat of butter, about $\frac{1}{3}$ of an ounce. This $\frac{1}{3}$ of an ounce yields a certain number of calories when burned in the body. Now if this $\frac{1}{3}$ of an ounce is taken in

excess of the daily needs, *only a little more*, to work off that particular extra pat of butter taken on that particular day you would have to do work equivalent, for example, to a walk from the bottom to the top of the Washington Monument.

The best way of all to lose fat is not to get fat. If you are fat then it is nearly hopeless to attempt to "work it off." There is only one way to lose it intelligently, and that is to limit your daily food intake slightly and burn it up slowly, but remember that if we ate each day 3 pats or one ounce of butter less than we really needed 25 pounds of fat would disappear in the course of a year. Of course, this could be done more rapidly although with some danger by complete fasting. In thirty-one days of complete fasting you could lose nearly 30 pounds, but again a good deal of this loss would still be water. It is impossible to lose weight and not lose some water, for the body is really 60 per cent. of water, but what you want to lose is the fat and that is the main objective in weight reduction.

Bathroom scales are a very good index for the long pull, for reduction covering months, and you cannot reduce except in terms of months. These fat zealots wish quick results, but think, those of you who are really overweight, how long you were putting on the extra poundage, usually several months if not years, so that you must take off that fat in a proportionately moderate way.

Reduction without the continual co-operation of a good physician may really be dangerous. Rapid results cannot be expected. No overnight treatment is of value. Most of the innumerable proposals for weight reduction other than by intelligent diet control are not worth serious consideration.

Each Calorie Counts

Every extra calorie that you eat, be it from starches, sugars, fat or protein, must be looked upon as a potential fat producer. Fats are, so to speak, twice as concentrated as starches and sugars; hence if one avoids all visible fats in the food this is helpful. Cutting out visible fats is usually not a great hardship, but of itself is of value only when there is no compensation by overeating of other equally fat-producing materials. It is useless to cut out any particular article of the diet, such as bread or potatoes, and then have the person fill up with ice cream. Diets of salads and greens which produce a feeling of fullness are sound in principle but may

easily be overdone and produce digestive disturbances.

Exercise in moderation is, of course, essential to health. Extreme exercise, especially if one is not used to it, may be easily overdone, and then there is always this point to bear in mind. A ten-mile walk to "work off fat" usually is a wonderful stimulant to an appetite all too ready to be appealed.

The use of patent preparations to produce slimness, such as various chewing gums, is nonsense. While it is true that certain glandular extracts and drugs hasten the burning up of material in the body and thus contribute in a small way, at least, to reduction, they are without exception dangerous to use without the continued advice of a competent physician. There is no royal road to slimness. Diet reduction, at times demanding a Spartanlike abstinence from especially loved foods, is the only really logical procedure. It all boils down to a careful, intelligent curtailment of food or fuel intake. It might be termed "scientific stoking."

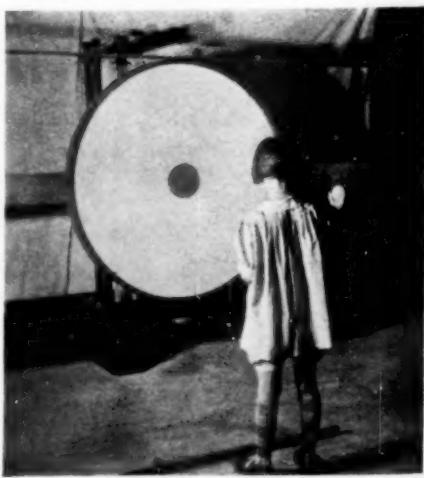
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PSYCHOLOGY

Children Learn Without Taking Special Training

IF YOUR boy wants to be champion basket-ball tosser, just growing older is likely to help him improve his skill as much as long hours of arduous practice.

For children improve in their ability at certain skills, such as weight-lifting, ball-throwing and other games or tasks requiring motor coordination, whether they are specifically trained to do these things or not, Dr. J. Allan Hicks, of



MATURING HELPS

This young lady to improve her skill in throwing a ball at a moving target.

the committee on child development of the National Research Council, has found.

Dr. Hicks believes that other factors such as the physical maturing of the

child and general physical training may contribute just as much to the learning of special skills as does special drill. His conclusions are reported in the current issue of *Child Development*.

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PHYSICS

Physicists Now Sure Vibrations Occur in Heart of Atom

Firing Alpha Rays Into Nucleus of Aluminum Atom Causes Ejection of Protons When Heart Is In Tune With Rays

VIBRATIONS within the innermost core of the atom have been proved to exist by firing high speed alpha rays into aluminum atoms, scientists of the Physical Institute of the University of Halle report.

The capture of a helium bullet by the excessively small heart or nucleus of an aluminum atom has been used in this work by Dr. H. Pose and Prof. G. Hoffman to probe the last great secret of the structure of matter. For this collision of the alpha particle with the aluminum atom is the signal for the ejection from the aluminum nucleus of a still faster kind of rays, the proton rays.

Those protons have been successfully cross-questioned by Dr. Pose and made to tell the story of the aluminum nuclei they have so suddenly left. Actually they are the cores of hydrogen atoms in rapid motion.

Four to five million volts would be required to give the hydrogen cores their high speeds by artificial means.

The speeds of those protons and of the particular alpha ray projectiles which start them on their way, give the new evidence of vibrations in the target atoms of the aluminum. At least Dr. Pose calls them vibrations.

Nothing material vibrates, however. Only a mathematical function with a highly complicated formula and the Greek name Psi. Physicists have been wary of making concrete pictures of the inside of the atom recently since the arrival of the new quantum theory.

The Psi vibrations are found in tune with oscillations which accompany certain of the alpha rays on their journey, called the De Broglie waves, another of the conceptions of the new physics. A proton is ejected when these two kinds

of oscillations get into step, just as an organist by playing the right note may wreck a building.

Distances traveled by the hydrogen particles before coming to rest in the air are used to measure their starting speeds. Dr. Pose found that three groups of hydrogens of differing speeds were sent out by the aluminum atoms.

The two faster groups which pass through 20 and 24 inches of air before stopping, appear only when special

CHEMISTRY

Chemists Hail Methyl Freed for Tenth of Second

METHYL, the atomic grouping found in poisonous wood alcohol as well as in a great many other natural and synthetic organic substances, has been isolated as a free compound. But it remains uncombined for only a tenth of a second.

By heating in a quartz tube a stream of the vapor of lead tetra-methyl, a substance similar to the anti-knock substance of ethyl gas, Drs. F. Paneth and W. Hofeditz of the University of Königsberg, have, for the first time, obtained the free radical or parent group of the methyl series of compounds. They have thus solved a problem that baffled the great chemists of the last century.

The substance triphenyl-methyl, first prepared in 1900 by Prof. Moses Gomberg of the University of Michigan, is the closest relation to the free methyl radical. Methyl contains one carbon atom united to three hydrogen atoms whereas in all other compounds, carbon

speeds of alpha-helium rays are present in the projectile atoms. The speed of the alpha rays determines the frequency of the accompanying De Broglie waves.

Dr. R. W. Gurney, working at the Institute of Physical and Chemical Research, Tokio, Japan, had previously suggested that resonance phenomena might be found in the nucleus similar to that observed in the outer layers of the atom. Dr. Pose believes that his own experiments show this. Slower projectiles with a voltage equivalent of 10 to 20 volts, for instance, cause the emission of colored light from the target atom when their speeds reach a very definite value.

Recent experiments of Drs. J. C. Chadwick, J. E. R. Constable and E. C. Pollard at the University of Cambridge, England, however, show that "alpha particles which are not in resonance with the nucleus are nevertheless able to cause a detectable amount of disintegration."

The alpha rays used by the German investigators are helium atom kernels given out by polonium, a radioactive substance similar to radium.

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has four bonds joining it to other atoms or groups of atoms.

Dr. Gomberg's compound and the new methyl radical of Drs. Paneth and Hofeditz are like political radicals in breaking the rules of the game. But they are broken only for a short time. The methyl radical very quickly decomposes or it combines with lead or zinc and forms normal compounds in which the carbon has its usual combining power of four.

The combinations of atoms like methyl or ethyl, which chemists call radicals, are found in compounds with other atoms. Thus methyl forms methyl chloride, CH_3Cl , a substance used as an anesthetic and refrigerant, and methyl hydroxide CH_3OH , which is wood alcohol, just as the metal sodium forms chloride, which is common salt, and sodium hydroxide which is caustic soda.

Methyl has the chemical formula CH_3 .

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ASTRONOMY

Eros Spins Nearly Five Times as Fast as Earth

EROS, the tabloid planet that has recently been paying one of its rare neighborly visits to the earth, spins nearly five times as fast as our planet. The fraction of .2195942 days, corresponding to 5 hours, 16 minutes and 12.94 seconds, represents the most accurate determination of its speed of rotation. This figure has just been announced by Prof. Leon Campbell, of the Harvard College Observatory.

Prof. Campbell's study was based on a long series of measurements of the brightness of Eros. The earliest observation he used was made in 1898, at the time of the first close approach of the planet after its discovery. The latest observation was one that he made himself on January 26 this year.

Science News Letter, March 28, 1931

ZOOLOGY

Prince Lion-Cub Speaks A Word for Himself

See Front Cover

MILK-TEETH are all he has as yet, and most of his active hours are spent in kittenish play; but let something happen to displease him, and for a moment the lion cub gives a hint of the royal terror that will clothe him when he reaches maturity. The protesting youngster pictured on the cover of this issue of the SCIENCE NEWS LETTER was photographed by Hedda Walther for Paul Eipper's book, "Animal Children." Copyright, 1930, by the Viking Press, Inc., New York. Reproduced by permission.

Science News Letter, March 28, 1931

ARCHAEOLOGY

Children's Graves Tell Story of Jointed Doll

DOLLS with real hair were treasured by children of ancient Egypt. Hair was fastened on to the doll's head with little wooden pegs, Dr. Kate McK. Elderkin, of Princeton, explains in a report tracing the ancient history of jointed dolls, in the *American Journal of Archaeology*.

Dr. Elderkin found available for her study a varied assortment of jointed dolls belonging to children of Egypt, Greece, and Rome. Some of these are in

existence in museums today because of the rather pathetic old, old custom of burying a doll in the grave of a child who had loved it. Other dolls have been found in the ruins of temples. According to Greek custom, girls who were about to be married took their dolls and doll clothes to the temple to dedicate them to Artemis or some other protecting goddess.

The oldest jointed dolls known are made of pottery and of wood and are from Egypt, Dr. Elderkin states. These date from 3000 B. C. to 2000 B. C. They are adult feminine types, as was characteristic of dolls throughout antiquity.

The oldest Egyptian dolls had the arms jointed only. Centuries later, children of Greece had dolls with legs as well as arms jointed. Dolls from about the fourth century were painted white or flesh colored. The hair, dressed in a knob on top of the head, was painted red or yellow. One of these dolls still has blue eyes.

The world's oldest dolls are not very large. The largest studied by Dr. Elderkin is a Roman doll a foot tall. This wooden lady, beautifully modeled, is dated by its fashionable hair arrangement, copied after the style of hairdressing worn by Faustina the Elder.

Science News Letter, March 28, 1931

PSYCHOLOGY

Girl Babies' Memories No Better Than Boys'

IF GIRLS can remember things better than boys, a superiority traditionally claimed for them, they must develop this ability some time after they are one year old. Recent researches by Prof. Chauncey N. Allen of Dartmouth College indicate that there is no sex superiority in memory in one-year-old babies.

Prof. Allen's work was done while he was on leave, at Columbia University. He tried out a considerable number of babies, letting them see him put away some object that they wanted. Then they were prevented from going after it immediately, but after the lapse of a brief time interval were turned loose.

He found that babies, both boy and girl, could remember where the lost plaything was for about half a minute. After that, they had either forgotten where it was, or lost interest in the matter. And the girls remembered no longer, on the average, than did the boys.

Science News Letter, March 28, 1931

IN SCIENCE

ORNITHOLOGY

"Eternal Triangle" Disrupts Stork Family

EVEN STORKS, traditional dispensers of the most domestic of all domestic matters, seem to be "going modern." A triangular tragedy involving a stork family is the story coming in from a village in the eastern part of Brandenburg, in Germany.

For many years the storks' nest stood upon a barn, occupied by the same pair, the male bird being easily identifiable because of a deformity of his left leg.

Last spring, while the female stork was sitting on her eggs, a strange stork appeared on a neighboring roof and was immediately attacked by the old male. The younger bird was victorious, however, and drove the older one off, immediately thereafter taking up with the female.

On the third of May, the five eggs lay broken upon the ground. On May 30 the new pair were again in possession of five new eggs. Two of these eggs they threw out of the nest.

The modernized "birth-controlling" storks raised three young birds, however, which grew up and departed, shortly after their parents, on the fall migration early in September.

Science News Letter, March 28, 1931

OCEANOGRAPHY

Drifting Bottle Crosses the Pacific

SI X THOUSAND six hundred miles, almost all the way across the mid-Pacific, is the record of a drifting bottle recently picked up among the Marshall Islands and reported to the U. S. Hydrographic Office. The paper within the bottle stated that it had been set adrift on June 16, 1927, by Capt. H. Ingalls of the American steamer *Solana*, in latitude 11 degrees 59 minutes north, longitude 91 degrees 16 minutes west. This position is off the southern coast of Central America. When found, the bottle was just a little north of the equator and in longitude 173 degrees 29 minutes east.

Science News Letter, March 28, 1931

SCIENCE FIELDS

GEOLOGY—BOTANY

Plant Growth Tells Of Rocks Beneath

HOW TREE and shrub associations over a countryside may be used to make a rapid survey of the kind of rocks that lie beneath, is told by Dr. Robert H. Cuyler of the University of Texas, in a report to the American Association of Petroleum Geologists.

Dr. Cuyler found, in a study of various geological formations in Texas, that each type of rock formation had a distinctive type of vegetation growing on it. One formation supported woods in which a species of oak predominated, another was covered with a juniper forest, a third was marked by mesquite thickets. Two maps of a selected region, one showing only the vegetation and the other only the rock formations, are found to be divided up into areas that correspond very closely in size and shape.

Dr. Cuyler believes that with the use of aircraft it will be possible to make very rapid geological reconnaissances of new territories, "seeing" the rocks beneath the soil without so much as sticking in a spade, merely by recognizing the types of vegetation associated with them.

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ARCHAEOLOGY

Ruins May Be City Where Noah Built the Ark

THE ANCIENT Sumerian city Shuruppak, believed to be the place where the Ark of Biblical fame was built, is being excavated by an expedition from the University of Pennsylvania Museum, it has been stated in Philadelphia. The Iraq Department of Antiquities has granted permission for the excavations, and work has been started.

The ruins of the city are in the midst of a desert about a hundred miles from Ur, where traces of a great flood were found. Dr. Erich Schmidt is directing the excavations.

"It is generally accepted that the Bib-

lical account of the deluge is derived from the Babylonian story of the flood that makes up part of the Gilgamesh Epic," explained Horace H. F. Jayne, director of the University Museum.

"The texts generally speak of five cities that existed before the deluge, and of these the City of Shuruppak was the native town of Uta-Naphistim, the Biblical counterpart of Noah. Here, according to accounts, the ark was built.

"In the early days of the present century the German archaeologist Koldey made trial excavations at Fara. Inscriptions discovered there led to the identification of modern Fara as the ancient city of Shuruppak. It is, therefore, one of the most interesting sites in Mesopotamia and one that may easily yield historical and artistic data comparable to that already unearthed at Ur and Kish."

Science News Letter, March 28, 1931

ZOOLOGY

Mule Deer Show More Sense Than Whitetail Cousins

THE HARDINESS and self-reliance of the mule or blacktail deer has again been demonstrated in Glacier National Park. Feeding grounds maintained at the Lake McDonald Ranger Station, on the west side of the park, are often visited by the mule deer, but, having obtained salt, they ignore the proffered hay and return to the higher country to forage for themselves. The whitetail deer, however, accept free hand-outs at the feeding grounds throughout the winter.

According to J. Ross Eakin, until recently superintendent of Glacier National Park, none of this high country is natural winter range for the deer. With the encroachment of ranches and settlements into their natural valley feeding grounds, however, the deer were forced to take to the higher country, and now they find refuge in the park.

Under these conditions the mule deer developed their natural resourcefulness and began foraging for themselves, even in cold weather. The whitetail, on the other hand, are less sturdy, and so must be helped throughout severe winters. It is interesting to note that during a hard winter, the mule deer going on his own appears in much better condition than the whitetail which has joined the bread—or hay—line at the feeding grounds.

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ARCHAEOLOGY

Tomb of Canadian Indians In Museum at Ottawa

AN INDIAN tomb, probably the last of its kind that will ever be found in the Dominion of Canada, has been received at the Victoria Memorial Museum at Ottawa. The wooden sepulcher was discovered on the shore of the Fraser river, near Vancouver, British Columbia, and was the work of some member of the Musqueam tribe. Only about fifty members of the tribe are now living.

Harlan I. Smith, Dominion archaeologist who discovered the tomb, believes that it contained two bodies, probably of a chief of high rank and his wife. The relic is an elaborately carved wooden box mounted on a boat-like platform about eight feet long. The bones found in the box were removed and interred before the sepulcher itself was sent here.

The most striking decoration on the box is the carving of four small animals on one side. These are pronounced "skumudgeons" or mythical sea otters. It is supposed that the skumudgeon was associated with the Indian brave who owned the tomb, perhaps acting as his guiding spirit during his lifetime.

Science News Letter, March 28, 1931

CHEMISTRY

"Chemist Shops" Don't Want To Be "Drug Stores"

THE British "chemist," whose counterpart in most countries is known as an apothecary, druggist, or pharmacist, may be debarred from using his present title if moves by the Institute of Chemistry achieve their end. Scientific chemists who may in all probability know nothing, or but little, of drugs and pharmacy, have always objected to their title being assumed by the licensed retailer of poisons and drugs, and the Institute has prepared a draft petition to the King praying for its members alone to be known as "Chartered Chemists."

However, since not all chemists are members of the Institute, and as it is reported that the Council of the Pharmaceutical Society takes "strong exception to the terms in which the petition is drafted," it seems more than likely that the British public will have no need yet awhile to alter its custom of referring to the "chemist's shop" when it means the drug store.

Science News Letter, March 28, 1931

PHYSICS

Same Current Gives Four Times The Light With New Lamp

**Using Heated, Glowing Sodium and Krypton, New Invention
Replaces Use of Filament and Points Way to Colder Light**

A NEW electric lamp that approaches more closely the efficiency of the glow-worm's cold light and produces three to four times the amount of light on the same current consumed by the best of incandescent lamps has been made experimentally here by Dr. M. Pirani of the Osram concern, German lamp manufacturers.

It is a development of the familiar red neon lamps of advertising signs. Electricity is passed through a heated mixture of metallic sodium vapor and the rare gas krypton.

A brilliant yellow light is produced. Whereas a tungsten filament incandescent lamp wastes 90 to 95 per cent. of the electrical energy in the form of heat, the new sodium-krypton tube produces four times as much light per unit of electricity fed it and wastes correspondingly less current as heat.

The yellowness of the light is at present a barrier to its use for ordinary artificial lighting as the light from the tube causes common objects to take on unnatural hues. The light is given out by the glowing gases and not by a white hot solid as is usual in present lamps.

An unusual feature of the new light is that the vapors through which the current passes are heated in an electric stove before entering the tube.

Glowing gas tube lamps giving white light and operating on ordinary house wiring have been announced commercially in America. These tubes contain mixtures of rare gases of the atmosphere: helium, neon, argon, krypton and xenon. They use less power than filament bulbs but are not so efficient as Dr. Pirani's experimental yellow light.

Lighting of a type similar to this is already in use in a newspaper office in Berlin. Softly glowing tubes one inch in diameter are stretched all the length of an arched ceiling, about six feet apart.

Absence of eyestrain and uniformity of illumination are advantages of the new system but the initial cost of installation is too great as yet for private homes.

White light indistinguishable from daylight, but of low watt or power efficiency has also been obtained in Dr. Pirani's laboratory by the use of carbon dioxide gas in the tubes. Another daylight tube, containing a mixture of mercury and sodium vapors, has a somewhat greater efficiency than the best tungsten incandescent lamp.

Sodium used in the yellow tube is present in common salt. Krypton like neon is present in small quantities in the atmosphere.

The use of the 110 volt current is made possible in the new artificial light by a hot cathode, as in a radio tube. Electrons boiling out from this allow the current to pass at lower voltages.

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perts were told by Robert A. Brown of Nashua, N. H. By playing artificial sunlight on the freshly printed paper, the oils in the ink are made to take up oxygen more quickly and thus become dry. Ozone, which is specially active oxygen, produces the same effect.

Chromium, the hard shiny metal that now replaces nickel on many auto parts, serves as a protective coating to type used in printing telephone directories and other publications that have large editions. Dr. Louis Weisberg, New York chemist, described this new application of electroplating.

Science News Letter, March 28, 1931

HYDROGRAPHY

Scientific Study Started Of Ice Currents in North

ICE from the North, and what brings it down into the navigated waters of the North Atlantic, will be the subject of a scientific research program lasting throughout the coming summer, under the auspices of the U. S. Coast Guard. A Norwegian scientist, Olav Mosby, has been sent out on the Coast Guard vessel *General Greene*, to work among the floes as they drift down the currents off the northeast coast of Newfoundland.

The expedition will be based at St. Johns, Newfoundland. The *General Greene* will stay at sea for periods of ten days to two weeks, and will then put back to base for fuel and supplies.

The ice involved in the recent *Viking* disaster off Newfoundland, Coast Guard officials said, was probably not of far northern origin, but came from local sources.

Besides the *General Greene*, which will take care of the strictly research side of the ice problem, the Coast Guard cutters *Ponchartrain* and *Mojave* will carry on the usual work of patrolling the steamer lanes in the iceberg regions, breaking up the bergs where practical and keeping steamers warned of their presence by radio. They will also keep Washington advised by daily radiograms of the distribution of ice. This work is carried on by international agreement, and is participated in by all the maritime nations of the North Atlantic, the United States having direct charge and furnishing vessels and personnel.

Science News Letter, March 28, 1931

As far back as 1835, chemists attempted to analyze rubber in the hope of some day making it synthetically.

PALEONTOLOGY

Discovery of Triceratops

"A Classic of Science"

Its Peculiar Horns, First Thought To Be From a Bison, Proved To Belong To a Strange Armored Dinosaur

NOTICE OF NEW FOSSIL MAMMALS; by O. C. Marsh. In *American Journal of Science*, Vol. XXXIV, p. 323. New Haven, 1887.

AMONG the large number of extinct mammals recently received at the Yale Museum from the West, are several of especial interest, as they serve to mark definite horizons in the Tertiary deposits east of the Rocky Mountains, or show important characters not before observed. A notice of some of these species new to science is given below, and more complete descriptions will appear elsewhere.

Bison alticornis, sp. nov.

This species of Bison is represented by various remains, the most important of which is the portion of a skull, figured below. This specimen, which may be regarded as the type, indicates one of the largest of American bovines, and one differing widely from those already described. The horn-cores, instead of being short and transverse, as in the existing bison, are long and elevated, with slender, pointed ends. They have large cavities in the base, but in the upper two-thirds are nearly, or quite, solid. Their position is well shown in the cuts. The frontal region between the horn-cores is broad, somewhat convex, and very rugose.

The remains of this species are found in the sandstones of the Denver group, at the eastern base of the Rocky Mountains, where they indicate a well-marked horizon, which may be called the Bison beds, and are probably late Pliocene.

The locality of the type specimen is on the banks of Green Mountain Creek, near Denver, Colorado, where it was found by George L. Cannon, Jr., of Denver. Portions of the same specimen were subsequently secured by Whitman Cross of the U. S. Geological Survey. Other remains were obtained by G. H. Eldridge of the Survey, and all were sent to the writer for examination.

A NEW FAMILY OF HORNED DINOSAURIA, FROM THE CRETACEOUS; by O. C. Marsh. In *American Journal of Science*, Vol. XXXVI, p. 447. New Haven, 1888.

During the past season, a special effort has been made by one field-party of the U. S. Geological Survey, to explore the Laramie formation, more particularly in Dakota and Montana. In this work, important collections of vertebrate fossils have been secured, and among them are remains of some new Dinosaurs of much interest, one of which is briefly described below.

Ceratops montanus, gen. et sp. nov.

The present genus appears to be nearly allied to *Stegosaurus* of the Jurassic, but differs especially in having had a pair of large horns on the upper part of the head. These were supported by massive horn-cores firmly coössified with the occipital crest. The latter are probably attached to the parietal bones, but, as the sutures in this region are obliterated, they may be supported in part by the squamosals.

The horn cores in the type specimen are sub-triangular at base, but nearly round in section in the upper half . . . These horn cores are slightly hollowed

at the base, but are otherwise solid. The exterior texture and markings show that they were evidently covered with true horns, and these must have formed large and powerful offensive weapons.

In position and direction, these horn-cores are somewhat similar to the large posterior pair of protuberances in *Meiolania*, one of the extinct *Testudinato*, and to the corresponding ones of the existing *Phrynosoma*. The only known example of similar structure in the *Dinosauria* is the single median horn-core on the nasals of *Ceratosaurus*, from the Jurassic. It is not improbable that there were other horn-cores on the skull in the present genus, but, of this, there is at present no positive evidence. A detached median prominence resembling a horn-core was found with some similar remains, but may pertain to an allied genus.

The resemblance in form and position of the posterior horn-cores to those of some of the ungulate mammals is very striking, and, if detached, they would naturally be referred to that group. . . .

The type specimen on which the present genus and species are based was found in place, in the Laramie deposits of the Cretaceous, in Montana, by Mr. J. B. Hatcher, of the U. S. Geological Survey. Other specimens apparently pertaining to the same species were secured in the same horizon of the same region.

Remains of the same reptile, or one nearly allied, had previously been found in Colorado, in deposits of about the same age, by Mr. G. H. Eldridge, also of the U. S. Geological Survey.

The associated fossils found with the present specimens are remains of other Dinosaurs, crocodiles, turtles, and fishes, mostly of Cretaceous types. The mol-



TRICERATOPS AS HE LOOKED IN LIFE

Restoration by Charles W. Gilmore of the U. S. National Museum, based on a complete skeleton in the Museum collection.



BISON ALTICORNIS

Part of Skull with Horn-cores, of the Dinosaur, which at first were believed to be bones of a fossil "buffalo."

lusk in the same beds indicate fresh-water deposits.

The fossils here described indicate a reptile of large size, twenty-five or thirty feet in length, and of massive proportions. With its horned head and peculiar dermal armor, it must have presented in life a very strange appearance.

The remains at present referred to this genus, while resembling *Stegosaurus* in various important characters, appear to represent a distinct and highly specialized family, that may be called the *Ceratopsidae*.

NOTICE OF NEW AMERICAN DINOSAURIA; by O. C. Marsh. In *American Journal of Science*, Vol. XXXVII, p. 331. New Haven, 1889.

In the large series of Dinosaurian remains brought together by the writer, in the last few years, and now under investigation, there are a number of new forms, some of which are briefly noticed below. These will all be fully described and figured in the memoirs now in preparation, by the writer, for the United States Geological Survey. . . .

Ceratops horridus, sp. nov.

The strange reptile described by the writer as *Ceratops montanus** proves to have been only a subordinate member of the same family. Other remains received more recently indicate forms much larger, and more grotesque in appearance. They also afford considerable information in regard to the structure of these animals, showing them to be true *Stegosauria*, but with the skull and dermal armor strangely modified and spec-

*This Journal, vol. xxxvi, p. 477, Dec., 1888. . . . The specimen figured in vol. xxxiv, p. 324, may prove to belong to the same genus.

ialized just before the group became extinct.

The vertebrae, and the bones of the limbs and of the feet, are so much like the corresponding parts of the typical *Stegosaurus* from the Jurassic, that it would be difficult to separate the two when in fragmentary condition, as are most of those from the later formation. The latter forms, however, are of larger size, and nearly all the bones have a peculiar rugosity, much less marked in the Jurassic species. In the form here described, this feature is very conspicuous, and marks almost every known part of the skeleton.

In the type specimen of the present species, the posterior horn-cores are much larger than these appendages in any other known animal, living or extinct. One of them measures at the base, no less than twenty-seven inches, and about sixteen inches around, half way to the summit. Its total height was about two feet. In general form, these horn-cores resemble those of *Ceratops montanus*, but the anterior margin is more compressed, showing indications of a ridge.

The top of the skull, in the region of the horn-cores, is thick and massive, and strongly rugose.

This skull as a whole must have had at least fifty times the weight of the skull of the largest *Sauropoda* known, and this fact will give some idea of the appearance of this reptile when alive.

As previously stated, the posterior pair of horn-cores of this family are hollow at the base, and in form and surface markings are precisely like those of the *Bovidae*. The resemblance is so close that, when detached from the skull, they cannot be distinguished by any anatomical character. This accurate repetition, in later and still existing forms, of the highly specialized weapons of an extinct group of another class is a fact of much interest.

The present specimen is from the Laramie formation of Wyoming, but fragmentary remains, which may be referred provisionally to the same species, have been found in Colorado.

THE SKULL OF THE GIGANTIC CERATOPSIDAE; by O. C. Marsh. Abstract of a paper read before the National Academy of Sciences, Philadelphia, November 14, 1889. In *American Journal of Science*, Vol. XXXVIII, p. 501. New Haven, 1889.

The huge horned Dinosaurs, from the Cretaceous, recently described by the writer, have now been investigated with

some care, and much additional light has been thrown upon their structure and affinities. A large amount of new material has been secured, including several skulls, nearly complete, as well as various portions of the skeleton. . . .

The unique characters of the skull of the *Ceratopsidae* are especially the following:

(1) The presence of a rostral bone, and the modification of the pre-dentary to form a sharp, cutting beak.

(2) The frontal horn-cores, which form the central feature of the armature.

(3) The huge, expanded parietal crest.

(4) The epoccipital bones.

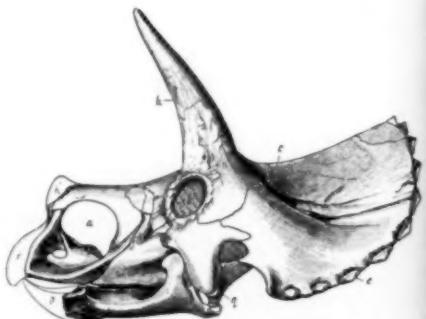
(5) The aborted transverse bone.

These are all features not before seen in the *Dinosauria*, and show that the family is a very distinct one.

The peculiar armature of the skull has a parallel in the genus *Phrynosoma*, among the lizards, and *Meiolania*, among the turtles, and it is of special interest to find it also represented in the Dinosaurs, just before their extinction.

Such a high specialization of the skull, resulting in its enormous development, profoundly affected the rest of the skeleton. Precisely as the heavy armature dominated the skull, so the huge head gradually overbalanced the body, and must have led to its destruction. As the head increased in size to bear its armor, the neck first of all, then the fore limbs, and later the whole skeleton, was specially modified to support it.

These features will be discussed in a later communication, but to the present description of the skull should be added the fact that the anterior cervical vertebrae were firmly coossified with each other, an important character not before observed in Dinosaurs.



TRICERATOPS FLABELLATUS

The skull, seen from the side, of the nearly complete specimen.

The skull represented on the accompanying plate is the type specimen of *Triceratops flabellatus*, Marsh. It was found in the Ceratops beds of Wyoming by Mr. J. B. Hatcher, who also discovered the type of the genus *Ceratops*, in the same horizon in Montana.

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CHEMISTRY

Male Sex Hormone Purified in Vacuum

MALE sex hormone, the glandular secretion responsible for typically masculine appearance and behavior on the part of male animals, is obtainable in a high state of purity by a method of vacuum distillation. The method was described before the Royal Academy of Sciences of Holland by a group of scientists of the pharmacotherapeutic laboratory of the University of Amsterdam. The group consists of Doctors E. Dingmasse, J. Freud, S. Kober, E. Laqueur and A. P. W. Münch.

They placed their glandular material, already partly purified by chemical processes, in a distilling apparatus which was exhausted to a nearly complete vacuum by means of an airpump. When heat was applied, it was found that the hormone came over in a very nearly pure state at temperatures between 80 and 90 degrees Centigrade, somewhat below the boiling point of water. Above 90 degrees other products also were distilled over, reducing the concentration of the hormone in the end-product.

The material obtained is probably not completely pure hormone. It does not wholly crystallize, but forms crystals that lie in an oily-appearing bath.

Thus far only very small quantities have been worked with, and experiments have yet to be made to learn whether the method can be used successfully for the purification of the hormone in pharmaceutical quantities.

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Life in
The Bronze Age
investigated by
Montelli
is the subject of the next
CLASSIC OF SCIENCE

ARCHAEOLOGY

Britons of the Stone Age Had Breakfast in Bed**Excavation of Ancient Village Reveals Stone Beds Holding Remains of Meals and Also Hidden Treasures**

EVIDENCE that our ancestors of the Stone Age really slept in stone beds has been obtained by Prof. V. Gordon Childe, of the University of Edinburgh in his excavations at Skara Brae, a ruined village in the Orkney Islands off Scotland.

In a report to the British journal, *Antiquity*, Prof. Childe describes the furniture of a bed-sitting room, marvelously preserved, in one of the stone huts at Skara Brae.

The beds, which stand against the wall of the stone hut, are oblong box-like enclosures with stone slabs for sides, held in place by stone wedges driven into the floor. The slabs at the head and foot are taller, like bedposts, and perhaps designed to support a canopy of skins, Prof. Childe suggests. For a mattress, the sleeper probably had ferns or heather.

Eating in bed seems to have been an old custom, judging by the gnawed bones found in the floors of the beds. Beads and other valuables were also found in them, showing that the mattress of a bed was a hiding place for treasures then, as today.

"Members of the family used to sit by day on the edge of the bed's front partition-slab, which is often noticeably worn save at the ends where the 'bed-posts' protected it," Prof. Childe stated. "Articles they were making or using are frequently to be met on the floor between this improvised seat and the fire."

Above each bed were recesses in the stone walls in the form of cupboard shelves. In these were kept personal belongings. The room also contained a stone cupboard with two tiers of shelves, a hearth in the center of the room, and several tanks sunk in the floor, apparently for keeping limpets fresh until they should be eaten.

Nine huts were excavated. Furniture in all was similar, it was found.

The village was abandoned precipitately, as a variety of valuable objects left in the huts testifies. Passageways in the houses were tiny, and speedy

flight was attended with difficulties. Prof. Childe found hundreds of beads and fine amulets dropped and scattered at the narrowest point in one doorway and along the passage.

No one ransacked the huts for valuables or removed the stone furniture. The village was buried in sand. Prof. Childe suggests that a storm of great severity was the enemy that routed the villagers.

The age of Skara Brae is not yet determined, but Prof. Childe considers that it was a belated Stone Age settlement, which existed in the British Bronze Age and which has been remarkably preserved through very unusual circumstances.

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PSYCHOLOGY-ETHNOLOGY

Goes to Mexico to Study Differences in Races

TO STUDY the effects of race crossing and to find out what differences, if any, exist between the minds of men of different races, is the purpose of an expedition which has departed for Yucatan, Mexico, under the direction of Dr. Morris Steggerda of the Carnegie Institution of Washington.

The expedition will be a follow-up of a study recently conducted by Dr. C. B. Davenport, director of the department of eugenics, of the Carnegie Institution of Washington, and Dr. Steggerda at Jamaica, British West Indies. In Jamaica, a number of psychological tests were given to three different color groups—Blacks, Browns, and Whites—all living under similar environmental conditions. It was found that the Whites received superior scores on 9 of the 12 tests given; in one test, that of form discrimination, there were no certain differences between the three groups; in one, the repetition of seven numbers, the Browns were superior; and in one, the Seashore test of musical ability, the Blacks came out ahead.

Science News Letter, March 28, 1931

BOTANY

Ergot Of Future May Be Raised In Drug Factories

Scientist Successfully Grows Important Fungus In Test Tube at University of Michigan Laboratory

ERGOT, one of the most important drugs used by physicians, may in the future be raised artificially in the laboratories of pharmaceutical factories, instead of being harvested in the natural state as at present. Preliminary experiments pointing to this possibility have been carried out by Miss Adelia McCrea in the botanical laboratories of the University of Michigan. Ergot is used to hasten labor and to check hemorrhage after childbirth.

The quality of ergot was the subject of a Senate committee hearing last June, as a result of charges that the federal food and drugs administration was allowing importation of impure and adulterated ergot. Miss McCrea's research raises the question of whether the growth of laboratory-raised ergot may not be so controlled as to insure a supply of the drug having a high degree of potency. It is too early, however, to consider practical applications of Miss McCrea's work, which is still in the realm of pure science.

Miss McCrea grew cultures of the fungus from which the drug is derived on a variety of media, including mashes and jellies made from various kinds of grain, and simpler jellies containing different sugars. She found malt sugar to be the best food for the fungus. To get ergot to grow in a flask or test tube at all is regarded as a considerable triumph, because under natural conditions it is a parasite, preying only on living plants. She found it to be fairly modest in its food requirements doing quite as well on a two or three per cent. concentration of malt sugar as it did on six or eight per cent., and failing to thrive at all at higher concentrations.

It was greedy for oxygen, however, growing much faster when a stream of pure oxygen was passed through its tube than when it was given only air. But on a mixture of half oxygen and half carbon dioxide its growth was considerably retarded. It grew best at tem-

peratures between 68 and 77 degrees Fahrenheit.

Light had a powerful effect on it. Without the shorter-wave visible rays—the blue end of the spectrum—it did not develop the purple color that is its most marked characteristic. Ultra-violet light, however, had no stimulating effect, and in repeated doses even retarded development.

Miss McCrea made physiological tests of the ergot growths she raised, and found that they produce most of the effects characteristic of natural ergot, though somewhat less powerfully. The reactions averaged from 40 to 75 per cent. of those obtained with the same concentrations of natural ergot.

In making these tests, however, she had to use the whole vegetative growth of her cultures, for they did not produce the full-grown fruiting bodies which are the only source of commercial ergot at present.

Miss McCrea also made two attempts to infect growing grain with ergot, with the idea that its field cultivation might be undertaken. At present, commercial ergot is obtained solely by hand-gathering of wild growths on grain, especially rye, and wild grasses. Because of the great amount of hand work involved, and the high cost of labor in this country, American production of ergot is unprofitable. However, the field experiments did not yield particularly encouraging results, and Miss McCrea concludes that if it ever becomes desirable or necessary to raise ergot in this country the laboratory method is the more promising.

A full technical account of Miss McCrea's work is contained in the *American Journal of Botany*.

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Some kinds of cactus plants can stand cold as severe as 30 degrees below zero.

Soundproof telephone booths have been installed at one California airport.

PALeOBOTANY

Nature Ramblings

By FRANK THONE



A Fossil Flower

NOW have come the days when we wait impatiently for spring flowers. But let us reflect how long the world had to wait for the earliest flowers of all. Millions, possibly billions of years, while crustaceans, fish and seaweed filled the sea and strange fern-like growths dominated the land, there were no flowers whatever.

During the teeming Coal Age, the first crude flowers came. They were still growths that we should hardly recognize as flowers, and they grew on trees that were the uncouth distant relatives of the modern pines and tropical cycads. They did result in seeds, and therefore they were technically flowers; but as yet there was very little hint of the beauty of petals and stamens yet to come.

In a later age, and again on trees related to the modern cycads—possibly ancestral to them—grew flowers that we might recognize as real flowers. They had no sepals and no petals, but consisted wholly of whorls of what might be called much-branched stamens and carpels. At any rate, the male flowers were made up of things that looked like reduced copies of the palm-like green leaves of the plant, each bearing not two, but whole rows, of pollen sacs. The modern stamen, with its mere pair of pollen sacs, is a much more specialized but much less complicated affair than this primitive flower-member.

These cycad-like plants abounded in the warm forests that then grew as far north as the Dakotas and the plains provinces of Canada. Their fossil remains have been dug up abundantly in the Bad Lands.

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ETHNOLOGY

**Eskimo's Igloo
Not a Snow House**

THE NOTED Arctic explorer, Vilhjalmur Stefansson, says that our idea of an Eskimo igloo is all wrong. Eskimos do on occasion live in the dome-shaped snow houses which they run up hurriedly as temporary shelters from the weather, but they never call them igloos.

The word igloo—which by the way Dr. Stefansson spells "iglu"—is applied by the Eskimos only to the solidly constructed houses of earth-covered stone and timber which are their really permanent winter quarters. He also cites other explorers and scientists of long Arctic experience, who state that throughout the Eskimo country only the permanent house is known as an iglu.

Dr. Stefansson's discussion of this subject is published in *Science*.

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THESE ARE REAL IGLOOS

And They Should be Spelled "Iglus," according to Vilhjalmur Stefansson. An iglu is a permanent structure of earth over a framework of timber, whalebone or stone; not a snow house.

ARCHAEOLOGY

Medieval Shrine Points Way To Ancient Roman Bridge

SCIENTIFIC detective work, in which an old shrine pointed the way to the hiding place of the ruins of a still older bridge, has been carried out by Prof. Siegfried Loeschke of the Provincial Museum at Trier, Germany.

In the days of the later Roman Empire, Trier was the capital of all the Roman world north of the Alps. Its widely assorted citizenry worshipped their many gods in a great group of temples in the valley of the little stream known as the Altbach, until a powerful Christian bishop in the fourth century made a clean sweep of the whole temple district, smashing the images of the gods and hurling the fragments of many of them into the creek bed. It was only within the past five years that the remains of this temple district were discovered and partly excavated by Prof. Loeschke and his associates.

After digging up the ruins of more than sixty temples and an ancient Roman theater, Prof. Loeschke turned his attention to the ancient creek bed, where the scattered images still presumably lie. The Altbach still flows along one side of the valley, skirting a hill; but the old bed is hidden under many feet of earth which have washed and

slid down in the course of the centuries. Digging an exploration trench into the hillside at random would have been prohibitively expensive.

Prof. Loeschke had already found the old Roman road that ran past the temple district. There must have been a bridge, he reasoned. His archaeological eye fell upon a weathered medieval shrine, the first of the fourteen Stations of the Cross, which had once climbed the hill to a monastery church.

Prof. Loeschke knew that the churchmen of the middle ages were accustomed to set the first of the Stations of the Cross in a place where many people gathered or passed, extending the rest of the series in the direction of the church door. It seemed logical to assume that the old monks had set their station in the Altbach valley alongside of a bridge that everybody had to cross. The bridge, now in ruins and deeply buried, would probably be the lost Roman bridge, marking the location of the stream sixteen hundred years ago.

A shaft was accordingly sunk as near to the old shrine as possible, and more than a dozen feet underground the diggers came upon the Roman bridge, as Prof. Loeschke thought they would. Funds are at present lacking for the

further exploration of the ancient creek bed; but Prof. Loeschke is confident that when money can be raised, either in Germany or abroad, the digging will be rewarded with a mass of ancient religious statuary such as can hardly be found elsewhere in the world.

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• First Glances at New Books

Biography

H. G. WELLS—Geoffrey R. Wells—*Norton*, 287 p., \$3. No student of the growth of public interest in science can afford to ignore the influence of H. G. Wells during the last forty years. Those who have grown up under the spell of his prodigiously active pen are apt to forget the part of the novelist-journalist-prophet of the scientific world state has played in their development. This generous but critical story of his life will help remind them and keep them pleasantly entertained the while.

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Horticulture

GARDEN POOLS, LARGE AND SMALL—L. W. Ramsey and C. H. Lawrence—*Macmillan*, 108 p., \$2.50. As the fireplace is the natural heart of the house, so the pool is the natural heart of the garden. This intelligently written and well illustrated book tells how to build pools, where to place them, and what to put in them.

Science News Letter, March 28, 1931

Penology—Education

THE EDUCATION OF ADULT PRISONERS—Austin H. MacCormick—*National Society of Penal Information*, 456 p., \$2.50. A thorough survey of the existing provisions, or lack of them, for the education of prison inmates together with some very practical recommendations. The appendices contain material, such as aids to book selection, suggestions for classifying, and a list of sources of educational films, which will be of great value to the librarian of any type of institution.

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Geography

THE ATLANTIC—Stanley Rogers—*Crowell*, 243 p., \$2.75. A history of the early voyages and sailors of the Atlantic, written and illustrated in a style that stirs the imagination.

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Astronomy—Exploration

STAR LISTS—Weld Arnold—*American Geographical Society*, 420 p. \$5. A list of stars for each degree of latitude from 60° north to 60° south, with their approximate local sidereal times and azimuths of crossing the altitude of 60°. Such a work is useful for the explorer in checking his longitude, for it enables him to find the local

sidereal time, and by radio signals he can ascertain G. M. T. It is intended to be used with the Reeves prism attachment for theodolites. With this device the image of a star is seen in the same field with the image reflected from a small pool of mercury. The two images approach and pass when the star is at exactly 60° altitude.

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Protozoology

HANDBOOK OF PROTOZOLOGY—R. R. Kudo—*Thomas*, 451 p., \$5.50. A valuable book for the student of microscopic life, whether he is interested in the subject as "pure" science or from the point of view of medicine, sanitation or any of its other myriad applications.

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Archaeology

ARCHAEOLOGICAL EXPLORATIONS IN PERU. Part II. The Northern Coast—A. L. Kroeber—*Field Museum of Natural History*, 115 p., 18 pl., \$1.50. In this report on the Second Marshall Field Expedition of 1926 in northern Peru, Dr. Kroeber describes the ruins which he inspected, some of which he considers worthy of intensive exploration. He also traces the probable course of Chimú culture, finding that it was very similar to the course of Mayan culture history.

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Medicine

CANCER—Willy Meyer—*Hoeber*, 427 p., \$7.50. The author reviews the theories and knowledge of cancer, its cause and treatment, and gives his views on them. The book will be of interest to physicians and surgeons, biologists, and physiological chemists. Not intended for the lay reader, and too technical for him.

Science News Letter, March 28, 1931

Biology

NATURAL HISTORY OF THE BAY SCALLOP—J. S. Gutsell—*Government Printing Office*, 63 p., 30c. In spite of its ever-increasing popularity, the scallop is still a shellfish of mystery to most of its devotees. This booklet makes information about it easily accessible to them as well as to the technical and professional readers for whom it was primarily issued.

Science News Letter, March 28, 1931

Psychology

THE LANGUAGE DEVELOPMENT OF THE PRESCHOOL CHILD—Dorothea A. McCarthy—*University of Minnesota Press*, 174 p., \$2.50. A study of speech of 140 children, twenty from each of seven age levels from 18 months to four and a half years. The investigator visited the children in their homes or schools and made a record of spontaneous speech in a natural situation. The total vocabulary was not obtained but rather the length and frequency of responses, the proportion of responses that was comprehensible, and the purpose of the response—whether to inform, to question, to command, etc.

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Zoology

THE LABORATORY MOUSE: ITS ORIGIN, HEREDITY AND CULTURE—Clyde E. Keeler—*Harvard University Press*, 81 p., \$1.50. Mice probably shared the caves of paleolithic men and the huts of the men of the new stone age; they certainly were known to Egyptians and other early civilized peoples. But it has been only recently that mice have found a serious work in the world, as bearers of the burden of human ills and as carriers with man into the secrets of genetics. It is fitting therefore that they should have this slender volume as a monument and at the same time as a means toward our better understanding of murine mysteries.

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Psychology

UNDERSTANDING THE CHILD—Edited by J. Mace Andress—*Massachusetts Society for Mental Hygiene, Quarterly Magazine*, \$1 per year. Intended for teachers, but of interest to a much wider field.

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Navigation

INTERNATIONAL ICE OBSERVATION AND ICE PATROL SERVICE IN THE NORTH ATLANTIC OCEAN (SEASON OF 1929)—*Government Printing Office*, 141 pp., 25c. A very interesting account of the work of the ice patrol in 1929, including tables of the icebergs encountered and a short history of the patrol. No one reading this can fail to be thrilled with the work of the Coast Guard in rendering impotent this great menace to navigation.

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